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Survey of cases of gonorrhoea caused by penicillinase producing *Neisseria gonorrhoeae* in the United Kingdom

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SUMMARY A postal survey of clinicians working in departments of genitourinary medicine in the United Kingdom was carried out to assess the accuracy of the routine surveillance system for penicillinase producing *Neisseria gonorrhoeae* (PPNG). A discrepancy was found between the number of cases that had been seen by clinicians and those notified to the Communicable Disease Surveillance Centre. The difference varied from 4% in 1979 to 23% in 1981. This increasing discrepancy presents problems for the control of PPNG strains, as the time when alternative strategies for the treatment of gonorrhoea should be implemented may go unnoticed.

Introduction

The emergence of penicillinase producing strains of *Neisseria gonorrhoeae* (PPNG) and the more recent description of the acquired immune deficiency syndrome have provided two of modern medicine's most fascinating clinical and epidemiological stories. Cases of patients infected with PPNG strains started to be reported in early 1976 in North America and the United Kingdom.[1-3] Although the two original endemic regions were West Africa and South East Asia, PPNG strains soon became endemic in the UK.[4]

A system of reporting PPNG strains in the UK was started in 1977 by the Communicable Disease Surveillance Centre (CDSC), and clinical data relating to age, sex, source of infection, and location of patients are collected. The number of cases reported has risen exponentially since 1977 and currently stands at 1223.[5] The increase in the number of cases caused by PPNG strains could threaten the control of gonorrhoea. Adequate control will depend on awareness of the size of the problem and a rapid intelligence and surveillance system for clinicians. This system is only as good as the data that clinicians and microbiologists feed into it. We conducted a study to assess the accuracy of the routine notification system and to see whether or not all cases of gonorrhoea caused by PPNG strains were reported to the CDSC.

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Methods

During 1982 all consultants in charge of 210 departments of genitourinary medicine in the UK were approached by letter. They were asked to indicate on a standard form the total cases of gonorrhoea and those caused by PPNG strains seen over the previous three years (1979-81). Consultants who did not reply were telephoned and written to again.

Results

Consultants in charge of 165 departments responded to the postal questionnaire (response rate 78·6%). Table I compares the routine reporting of PPNG strains to the CDSC with the number of cases that the consultants reported direct through the postal survey. In 1979, 104 cases were reported to the CDSC and 108 via the postal survey; a small difference of just under 4%. The discrepancy increased, however, in each subsequent year; in 1980 it was 17% and in 1981 it was 23%. Thus, the more common PPNG

TABLE I *Cases of gonorrhoea caused by PPNG strains reported to Communicable Disease Surveillance Centre compared with those reported in postal survey*

	1979	*1980*	*1981*	*Total*
No reported to CDSC	104	211	443	758
No reported in postal survey	108	248	547	903
Difference (%)	4 (3·8)	37 (17·5)	104 (23·5)	145 (19·1)

PPNG = Penicillinase producing *Neisseria gonorrhoeae*.

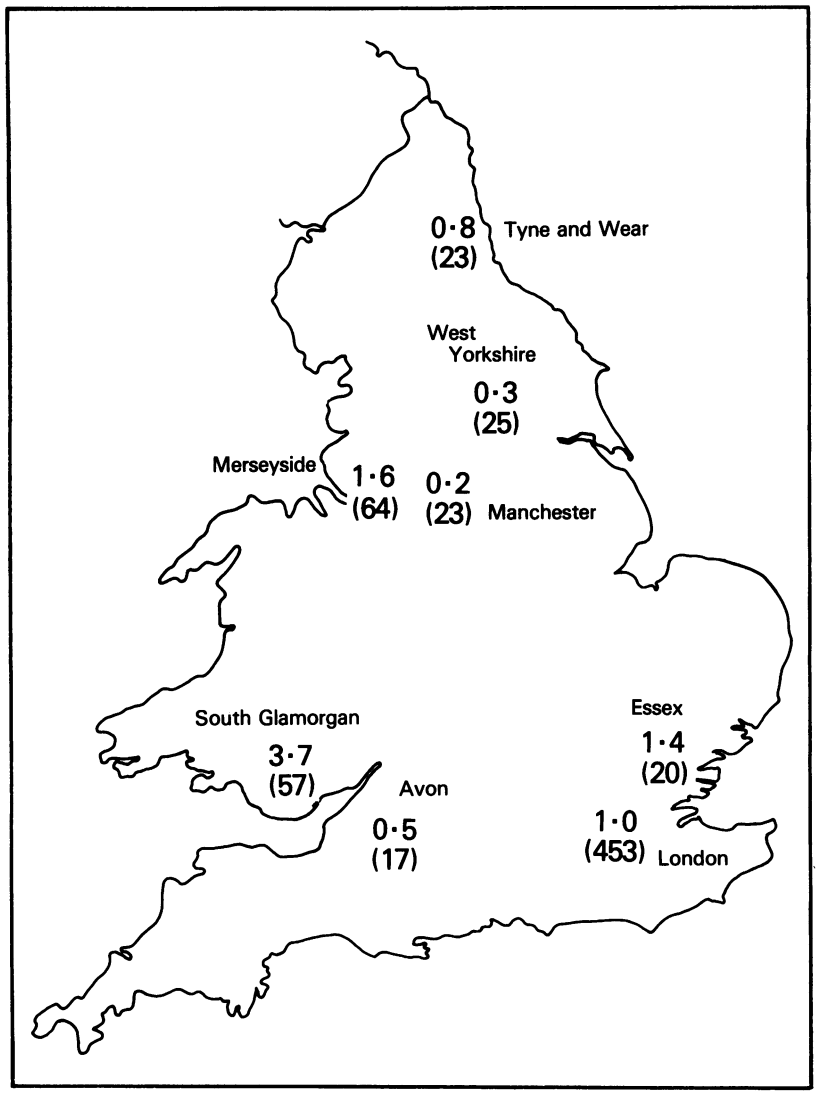

FIGURE *Proportion (No) of cases of gonorrhoea due to penicillinase producing Neisseria gonorrhoeae in eight areas of highest incidence in 1979-81.*

strains became, the more likely it was that the official notification system through the CDSC was inaccurate. The overall discrepancy over the three years of the survey was nearly one fifth and at its greatest (in 1981) was nearly a quarter.

Regional differences in the incidence of PPNG strains are not routinely available through the CDSC notification system. The figure shows the eight areas in England and Wales (Tyne and Wear, West Yorkshire, Merseyside, Manchester, South Glamorgan, Avon, London, and Essex) that were identified through the postal survey as having the highest incidence. The incidence for each area is for the three years covered by the survey. Table II shows the figures for each year. South Glamorgan had the highest proportion (3·7%), which was mainly due to a large number of cases seen in a brief outbreak in 1981 when the proportion was 9·4%. The next two areas with high proportions of PPNG strains were Merseyside (1·6%) and Essex (1·4%) where the figures were more constant than in South Glamorgan. During the three years of the survey the overall proportion of PPNG strains in the eight areas was just below 1% and ranged from 0·3% to 1·7%.

TABLE II *No of cases of gonorrhoea due to PPNG strains in eight areas of greatest incidence 1979-81 as proportion of total incidences of gonorrhoea*

Area	Proportion of case of gonorrhoea due to PPNG strains in: 1979	1980	1981	All 3 years
London	0·3	0·8	1·8	1·0
Merseyside	1·0	1·3	2·6	1·6
South Glamorgan	0·0	1·5	9·4	3·7
West Yorkshire	0·0	0·2	1·0	0·3
Manchester	0·1	0·4	0·2	0·2
Tyne and Wear	0·4	0·9	1·0	0·8
Essex	0·2	1·4	2·9	1·4
Avon	0·5	0·2	0·7	0·5
Total	0·3	0·7	1·7	0·9

PPNG = Penicillinase producing *Neisseria gonorrhoeae.*

Discussion

The survey indicated an increasing discrepancy between the official notification system and an ad hoc postal survey. The control of PPNG strains is largely dependent on an awareness of the size of the problem. Some clinics carry out in house monitoring of PPNG strains in the knowledge that the incidence can alter considerably in a short time and that alternative treatment strategies will be required. This is highly desirable, but the results of such monitoring must become part of the official notification system through the CDSC. Unless this occurs, colleagues in other centres will not be forewarned of the potential increase in the size of the problem both locally and nationally. Once the prevalence of PPNG strains is 5% or more the standard control measures of alternative treatment regimens that are aimed only at high risk groups (such as those failing to respond to penicillin, contacts of known PPNG cases, and travellers from endemic areas) may be considered to have failed. All cases of gonorrhoea should then be treated with the alternatives of spectinomycin or a cephalosporin.[5-8] Unless the notification system is more sensitive, the critical level (be it 5% or more) may have been reached some time before the fact is widely appreciated, alternative treatment approaches will not have been implemented, and there will be potential loss of control of an outbreak of PPNG strains. Within the UK the incidence of PPNG strains is low and was 2% in 1983.[5] Even though the report published here shows an under notification of 23% for the final year of the survey and 19% for the three years combined, a correction for this still means that the incidence was less than 5%.

It is difficult to predict what would have occurred had all centres approached responded. The 78·6% that did so saw 78% of all cases of gonorrhoea in the UK during the three years of the survey. We think it unlikely that the clinics that did not respond saw proportionately more gonorrhoea or PPNG strains than those who took part or that the overall national discrepancy in PPNG strains reported would have altered had they taken part.

The response rate underlines the fact that clinicians are busy providing care for patients and often find the notification and documentation of cases an unnecessary and an unrewarding burden. It is essential that central bodies such as the CDSC who require data make them useful to clinicians. The rapid feedback of data to clinicians in a local and national form would encourage them to take part in an official notification system.

References

1. Ashton WA, Golash RG, Hemming VG. Penicillinase-producing *Neisseria gonorrhoeae. Lancet* 1976;ii:657-8.
2. Phillips I. β lactamase-producing, penicillin-resistant gonococcus. *Lancet* 1976;ii:656-7.
3. Percival A, Corkhill JE, Arya OP, *et al.* Penicillinase-producing gonococci in Liverpool. *Lancet* 1976;ii:657-8.
4. McCutcham JA, Adler MW, Berrie JH. Penicillinase-producing *Neisseria gonorrhoeae* in Great Britain, 1977-1981: alarming increase in incidence and recent development of endemic transmission. *Br Med J* 1982;**285**:337-40.
5. Public Health Laboratory Service Communicable Disease Centre and the Communicable Diseases (Scotland) Unit. Penicillinase-producing gonococci in Britain, 1983. *Br Med J* 1984;**288**:1746.
6. Perrine P, Morton RS, Piot P. *et al.* Epidemiology and treatment of penicillinase producing *Neisseria gonorrhoeae. Sex Transm Dis* 1979;**6** suppl:152-8.
7. Berg SW, Kilpatrick ME, Harrison WO, McCutchan JA. Cefoxitin as a single dose treatment for urethritis caused by penicillinase producing *Neisseria gonorrhoeae. N Engl J Med* 1979;**301**:509-11.
8. Nayyar KC, Michel MF, Stolz E. Antibiotic sensitivities of gonococci isolated in Rotterdam and results of treatment with cefuroxime. *British Journal of Venereal Diseases* 1980; **56**:249-51.
9. McCormack WM. Penicillinase producing Neisseria gonorrhoeae—a retrospective. *N Engl J Med* 1982;**307**:438-9.